



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,383	10/16/2003	Muqtada Husain	10541-1825	2102

7590 08/16/2004

Douglas D. Fekete  
BRINKS HOFER GILSON & LIONE  
P.O. Box 10395  
Chicago, IL 60610

EXAMINER

LUM VANNUCCI, LEE SIN YEE

ART UNIT	PAPER NUMBER
----------	--------------

3611

DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/687,383

Applicant(s)

HUSAIN ET AL.

Examiner

Lee Lum

Art Unit

3611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

1. The disclosure is objected to because of the following issues:

The following elements lack antecedent basis:

in Claim 1, last paragraph – road wheel orientation,

in Claims 6 and 10, first paragraph – orientation.

In Claim 1, line 7, “comand” is a misspelling.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- A. **Claims 1-3, 6 and 10-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hjelsand et al 6575263 in view of Radamis et al 6609052.

Re Claims 1, 2 and 6, Hjelsand discloses a steer-by-wire system including

Rack (unidentified; col 4, lines 25-29) mechanically coupled to the road wheels,

Electric motor (col 4, lines 20-22) coupled to the rack,

Road wheel sensor 23 indicating response to a steering command,

Controller 15,

Driver interface subsystem comprising

Steering wheel 51,

Reaction torque generator 111 coupled to the steering column for applying a resistive torque to the steering command, and,

Mechanical brake, including elements in fig 5; 119/121/123/125/129/131, coupled to the steering column to prevent rotation of the steering wheel,

Art Unit: 3611

Wherein the controller determines when the road wheel has reached a limit, and actuates the brake in response (col 9, third paragraph), and,

The limit corresponds to the road wheels engaging a stop 129 mounted on the vehicle.

The reference does not disclose the brake as electromechanical, while Radamis discloses this type of brake in col 4, lines 55 and 60-61. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this type of brake, as shown in Radamis, to provide a more compact, and reliable, means of braking, as compared to a mechanical means as exemplified in Hjelsand. This type of brake/resistive means is well-known in the art.

Re Claim 3, Hjelsand does not disclose the limit as indicating a failure of the road wheels to change orientation in response to a steering command, while Radamis shows this configuration in col 5, lines 42-44, and col 6, lines 32-38, in which the controller executes certain remedial commands. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this arrangement, as shown in Radamis, to increase the accuracy and efficiency of the system in case of particular failures, thereby increasing occupant safety and comfort.

Re Claims 10-13, the references disclose a method of operating a steer-by-wire system as described above, the steps derived from the structure and means provided above.

B. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hjelsand in view of Radamis, and in further view of Andonian et al 6557662 and Shimizu et al 4825972.

The previous references do not disclose the brake as including a rotor that forms part of the steering column, while Andonian provides this element 18 in the MR device 12 in figs 1 and 2. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this configuration, as shown in Andonian, to decrease the number of elements in the device, thus decrease design and assembly costs.

Art Unit: 3611

The previous references do not disclose the torque generator as a motor including a belt and pulley, while Shimizu shows this type of motor configuration. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this type of generator, as shown in Shimizu, to provide a reliable and well-known type of motor for this type of application. Prior art discloses various types of motors, and they are functionally equivalent.

C. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hjelsand in view of Radamis, and in further view of Shimizu.

The previous references do not disclose the torque generator as a motor including a belt and pulley, while Shimizu shows this type of motor configuration. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this type of generator, as shown in Shimizu, to provide a reliable and well-known type of motor for this type of application. Prior art discloses various types of motors, and they are functionally equivalent.

D. **Claims 5, 8 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hjelsand in view of Radamis, and in further view of Nakano et al 6523637.

The previous references do not disclose the sensor as detecting displacement of the rack, while Nakano shows this sensor 146 in col 5, lines 64-67. While one type of sensor for detecting the road wheel response to a steering command is functionally equivalent to another type, it would have been obvious to one with ordinary skill in the art at the time the invention was made to include this type, as shown in Nakano, since it takes advantage of the rack mechanism existing in the embodiment, thus decreasing costs associated with design, manufacture and assembly of another type of sensor.

Art Unit: 3611

E. **Claims 9 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hjelsand in view of Radamis, and in further view of Miller 6422335.

The previous references do not disclose the sensor as comprising increased load on the motor, while Miller shows this sensor 210. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this type of sensor, as shown in Miller, to provide more information re system operation to the controller, thus increasing its accuracy and performance, and increasing occupant safety and comfort.

F. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hjelsand in view of Radamis, and in further view of Andonian et al 6557662.

The previous references do not disclose actuating the brake when the torque generator fails, while Andonian provides this arrangement in col 3, lines 3-9; "provide a redundant back-up system to the MF device". It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this arrangement, as shown in Andonian, to provide a contingency to the failure of the torque generator, thus increasing occupant safety and comfort in this situation.


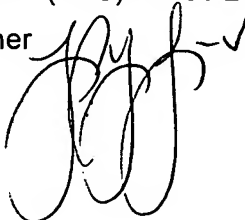
3. The prior art made of record, and not relied upon, is considered pertinent to the disclosure: Thomas et al 6659218, 6550565, Park et al 6612392, Menjak et al 6598695, Stout et al 6505703, Borsting et al 6484838, Kaufmann et al 6370460, Kawaguchi et al 6213248, Serizawa et al 5097917.

4. Communication with USPTO/Examiner

Any inquiry concerning this communication, or others, should be directed to Ms. Lum at 703 305-0232, M-F, 9-6. If attempts to reach the examiner are unsuccessful, her supervisor, Ms. Lesley Morris is at 703 308-0629. Our fax number is 703 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for unpublished applications: private PAIR only, for published applications: private or public PAIR. For more information re PAIR: <http://pair-direct.uspto.gov>. Questions re private PAIR: contact the Electronic Business Center (EBC) at 866 217-9197.

Ms. Lee S. Lum, Examiner  
8/2/04



LESLEY D. MORRIS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600